

We Claim:

1. A showerhead for substrate processing including:
a gas inlet leading to a gas reservoir;
- 5 a faceplate fitted between the reservoir and a processing space, the
faceplate including a plurality of orifices, and
a sheet including a plurality of orifices, the sheet orifices being smaller in
size than the minimum diameter of the faceplate orifices,
wherein the sheet is fitted in or on the showerhead such that the fluid
passes to the process space from the reservoir via the sheet orifices.
- 10 2. A showerhead according to Claim 1, wherein the sheet is sealed to the
faceplate.
3. A showerhead according to Claim 1, wherein the sheet is attached into or
on the faceplate.
- 15 4. A showerhead according to Claim 1, wherein the sheet is fitted between
the reservoir and the faceplate.
5. A showerhead according to Claim 1, wherein the sheet is fitted between
the reservoir and the faceplate and wherein at least some of the faceplate
orifices are not aligned with the sheet orifices.
- 20 6. A showerhead according to Claim 1, wherein the sheet is fitted between the
faceplate and the process space.
7. A showerhead according to Claim 1, wherein the sheet is fitted between
the faceplate and the process space and the sheet is formed of a fluorine
scavenging material.
- 25 8. A showerhead according to Claim 1, wherein the sheet is fitted between
the faceplate and the process space and the sheet includes silicon or
carbon.

9. A showerhead according to Claim 1, wherein the centres of faceplate orifices and the sheet orifices are substantially aligned.
10. A showerhead according to Claim 1, wherein the showerhead further includes a dividing plate having a plurality of orifices, the dividing plate defining two reservoirs and the sheet is fitted adjacent the dividing plate.
11. A showerhead according to Claim 1, wherein the showerhead further includes a dividing plate having a plurality of orifices, the dividing plate defining two reservoirs and the sheet is fitted adjacent the dividing plate and wherein the sheet is fitted between the dividing plate orifices and the orifices of the faceplate.
12. A showerhead according to Claim 1, wherein the showerhead further includes a further sheet adjacent the first sheet, the orifices of the further sheet being larger in size than the orifices of the first sheet, the first sheet and the further sheet being arranged such that fluid flows through the orifices of both sheets.
13. A showerhead according to Claim 1, wherein the sheet is formed of an elastomeric material or a metal or a plastic.
14. A showerhead according to Claim 1, wherein the showerhead further includes a further sheet adjacent the first sheet, the orifices of the further sheet being larger in size than the orifices of the first sheet, the first sheet and the further sheet being arranged such that fluid flows through the orifices of both sheets and wherein the further sheet is formed of an elastomeric material.
15. A showerhead according to Claim 1, wherein the sheet orifices are approximately 0.5mm or less in diameter.
- 25 16. A showerhead according to Claim 1, wherein the sheet orifices are approximately 0.15mm in diameter.

17. A method of manufacturing a showerhead for substrate processing, the method including steps of:

forming a plurality of orifices in a sheet, and

fitting the sheet in a showerhead having a gas inlet leading to a gas reservoir and a faceplate fitted between the reservoir and a processing space, the sheet being fitted in or on the showerhead such that fluid passes from the reservoir to the processing space via the sheet orifices, wherein the size of the sheet orifices is less than the minimum diameter of orifices in the faceplate.

5 18. A method according to Claim 17, wherein the orifices are formed by photoetching, spark erosion, laser forming, moulding, stamping, die cutting or plasma etching.

10 19. A sheet adapted for fitting in a showerhead for substrate processing, the sheet including a plurality of orifices of diameter smaller than the minimum diameter of orifices in a faceplate of the showerhead into which the sheet is to be fitted.

15 20. A sheet according to Claim 19, wherein the thickness of the sheet is less than 1mm.

20 21. A sheet according to Claim 19 formed at least in part of an elastomeric material.